

**IN THE CLAIMS**

Claims 1-2. (Cancelled)

Claim <sup>2</sup>~~3~~. (Allowed) The process according to claim 22, wherein said non-hydrolyzable substituent is H, an alkyl, aryl or fluoroalkyl group or an aminoalkyl group.

Claim <sup>3</sup>~~4~~. (Allowed) The process according to claim ~~22~~, wherein said step c) of drying the gel is a liophilisation carried out at a pressure lower than 70 mm Hg, to obtain a mesoporous aerogel powder.

Claim <sup>4</sup>~~5~~. (Allowed) The process according to claim ~~22~~, wherein said step c) of drying the gel is a mild heat treatment carried out at an atmospheric pressure and a temperature no greater than 100°C.

Claim <sup>5</sup>~~6~~. (Allowed) The process according to claim ~~22~~, wherein said nitroxyl radical is added to said solution along with said monomer precursor in a one-step procedure.

Claim <sup>6</sup>~~7~~. (Allowed) The process according to claim ~~22~~, wherein in a two-step procedure, first said monomer precursor is hydrolyzed in part with water in the

presence of an acid and then said nitroxyl radical is added to this solution, to obtain a porous sol-gel polymeric oxide with a fractal macromolecular structure.

Claim 8. (Cancelled)

<sup>7</sup>  
Claim ~~9~~ (Allowed) The process according to claim ~~22~~, wherein said reductive amination is carried out by stirring a solution of said 4-oxo-TEMPO in methanol with said 3-aminopropyl-trimethoxysilane, and reducing the thus formed imine with  $\text{NaBH}_3\text{CN}$ .

<sup>8</sup>  
Claim ~~10~~ (Allowed) The process according to claim ~~8~~, wherein said nitroxyl radical is TEMPO or a precursor thereof and said radical is physically entrapped within a sol-gel matrix adding a solution thereof in methanol to said precursor following said one-step procedure.

<sup>9</sup>  
Claim ~~11~~ (Allowed) The process according to claim ~~22~~, wherein said catalytic porous materials are in the shape of powders, films, monoliths, or fibers.

Claims 12-13. (Cancelled)

<sup>11</sup>  
Claim ~~14~~. (Allowed) A process according to  
<sup>10</sup>  
claim ~~23~~, wherein said liquid phase is an organic  
solvent, a biphasic organic solvent-water system, or  
water and said primary oxidant is NaOCl, NaOBr, HNO<sub>3</sub>,  
CuCl/O<sub>2</sub>, K<sub>3</sub>Fe(CN)<sub>6</sub>, or NO<sub>2</sub>.

<sup>12</sup>  
Claim ~~15~~. (Allowed) A process according to  
<sup>10</sup>  
claim ~~23~~, wherein said alcohol substrate is an alkyl  
alcohol, an aryl alcohol, a steroid alcohol, an allylic  
alcohol, a terpenoid alcohol or retinol and it is  
oxidized in a bi-phasic reaction system CH<sub>2</sub>Cl<sub>2</sub>-H<sub>2</sub>O, said  
primary oxidant is aqueous alkaline NaOCl and wherein  
said nitroxyl radical is 4-oxy-TEMPO and said monomer  
precursor is 3-aminopropyl-trimethoxysilane to obtain a  
catalytic material containing chemically linked radicals.

<sup>13</sup>  
Claim ~~16~~. (Allowed) A process according to  
<sup>16</sup>  
claim ~~23~~, wherein said alcohol substrate is a monomer or  
an oligomeric carbohydrate protected at the anomeric  
center, said solvent is water, said oxidant is alkaline  
NaOCl or NaOCl in the presence of a catalytic amount of  
NaBr, and wherein said nitroxyl radical is 4-oxy-TEMPO  
and said monomer precursor is 3-amino-propyl-  
trimethoxysilane to obtain a catalytic material  
containing chemically linked radicals.

<sup>14</sup>  
Claim ~~17~~. (Allowed) A process according to  
claim <sup>13</sup>~~16~~, wherein said catalytic material is in the form  
of pumice stones coated with said sol-gel film doped with  
said nitroxyl radicals, and said carbohydrate is a water  
soluble polymer.

<sup>15</sup>  
Claim ~~18~~. (Allowed) The catalytic material  
doped with a chemically linked nitroxyl radical obtained  
with a process as claimed in claim ~~22~~.

<sup>16</sup>  
Claim ~~19~~. (Currently amended) The process  
according to claim ~~1~~ <sup>1</sup>~~22~~, wherein P is a non-hydrolyzable  
substituent.

Claim 20. (Cancelled)

<sup>17</sup>  
Claim ~~21~~. (Allowed) A process according to  
claim <sup>10</sup>~~28~~, wherein said alcohol substrate is an alkyl  
alcohol, an aryl alcohol, a steroid alcohol, an allylic  
alcohol, a terpenoid alcohol or retinol and it is  
oxidated in a bi-phasic reaction system  $\text{CH}_2\text{Cl}_2\text{-H}_2\text{O}$ ,  
wherein said primary oxidant is aqueous alkaline  $\text{NaOCl}$ ,  
and wherein said nitroxyl radical is 4-oxy-TEMPO and said  
monomer precursor is 3-aminopropyl-trimethoxysilane to

obtain a catalytic material containing chemically linked radicals, wherein said radical is tethered to said monomer precursor through reductive amination by stirring for three hours a solution of 4-oxo-TEMPO in methanol with a slight excess of 3-aminopropyl-trimethoxysilane, and reducing the thus formed imine with  $\text{NaBH}_3\text{CN}$ .

Claim ~~22~~. (Allowed) A process for the preparation of a reactive sol-gel catalytic porous material comprising chemically doping said material with stable organic nitroxyl radicals, by carrying out the steps of:

copolymerizing a solution including:

a) 3-amino-propyl-trimethoxysilane as a monomer precursor;

b) a dopant consisting of 4-oxy-TEMPO as a stable nitroxyl radical or a precursor thereof;

c) a solvent including  $\text{H}_2\text{O}$  and a co-solvent selected from the aliphatic alcohols; an acid or base to catalyze the processes of sol-gel hydrolysis and copolymerization; and one or more additives selected from those known to be useful in the preparation of porous materials to form a gel containing said dopant trapped therein;

d) tethering said radical to said monomer precursor through reductive amination, said solution including H<sub>2</sub>O as a solvent and a co-solvent from the aliphatic alcohols; an acid or base to catalyze the processes of sol-gel hydrolysis and copolymerization; and one or more additives selected from those known to be useful in the preparation of porous materials to form a gel containing said dopant chemically trapped therein;

e) evaporating said solvent;

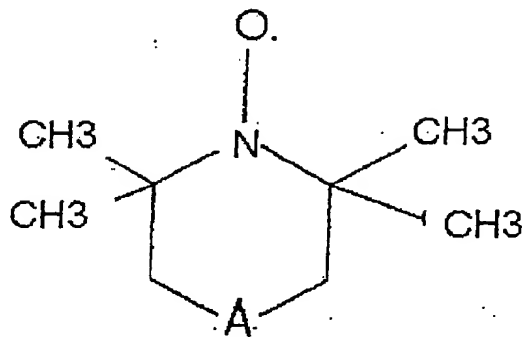
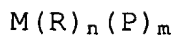
f) drying said gel; and

g) coating said gel on a mesoporous inorganic support.

<sup>10</sup>  
Claim 23. (Allowed) A process for a liquid-phase oxidative conversion of a substrate of a primary or secondary alcohol into a carbonyl or carboxyl derivative thereof, comprising said conversion being carried out with said substrate in catalytic presence of a reactive sol-gel catalytic porous material either chemically or physically doped with stable organic nitroxyl radicals, said material being coated on a mesoporous inorganic support and containing a copolymer of

a) at least one monomer precursor selected from the group consisting of metal and semi-metal alkoxides,

metal esters and semi-metal esters, of the general formula



wherein M is a metal or a semimetal, R is an hydrolyzable substituent, P is a non-hydrolyzable group, n is an integer of 1 to 6, and m is an integer of 0 to 6, and

b) a dopant consisting of a stable di-tertiary-alkyl nitroxyl radical or a precursor thereof of formula, wherein A represents a chain of two or three carbon atoms, one or two of said carbon atoms being eventually substituted by one oxygen or nitrogen atom, and one or more additives selected from those known to be useful in the preparation of porous materials to form a gel containing said dopant trapped therein.

Claim <sup>16</sup>~~24~~. (New) A process for liquid-phase oxidative conversion of a substrate of a primary or secondary alcohol into a carbonyl or carboxyl derivative thereof, comprising conducting said oxidative conversion

in the presence of a doped catalytic material according  
to claim ~~22~~<sup>1</sup>, and in the presence of a primary oxidant  
effected in selective alcohol oxidations mediated by  
nitroxyl radicals.